

WHAT IS CLAIMED IS:

1. An optical pickup device, comprising:

a light source for emitting a light;

a condenser lens for focusing a reflected light from a recording medium of the light emitted from said light source;

dividing means for dividing a light passed through said condenser lens into a light passed through a high numerical aperture region of said condenser lens and a light passed through a low numerical aperture region of said condenser lens;

light receiving means including at least a first light receiving element for detecting the light passed through said high numerical aperture region and a second light receiving element for detecting the light passed through said low numerical aperture region; and

focus control means which prepares a first focus error signal based on an output signal at least from said first light receiving element and a second focus error signal based on an output signal from said second light receiving element, and which performs a focus control based on either the first focus error signal or the second focus error signal according to an output value from said light receiving means.

2. The optical pickup device as set forth in claim 1, wherein:

said focus control means selects as a signal used in the focus control, the first focus error signal when a value indicative of the first focus error signal is within a range where the focus control can be performed based on the first focus error signal, while selects the second focus error signal when the value indicative of the first focus error signal is outside the range where the focus control can be performed based on the first focus error signal, and a value indicative of the second focus error signal is within a range where the focus control can be performed based on the second focus error signal.

3. The optical pickup device as set forth in claim 1, wherein:

said focus control means performs the focus control based on the first focus error signal when an output voltage indicative of a total amount of received light by light receiving elements including the first light receiving element of said light receiving means is larger than a light amount reference value set in a characteristic curve thereof, and an absolute value of the first focus error signal is not more than a signal

reference value set in a characteristic curve thereof.

4. The optical pickup device as set forth in claim 1, further comprising:

an objective lens; and

an actuator for driving said objective lens in a focusing direction,

wherein said focus control means controls said actuator such that said objective lens is moved to a first position to be away from the recording medium when the focus control means becomes not capable of performing the focus control based on the first focus error signal nor performing a focus control based on the second focus error signal, and that a pulling-in operation is performed so as to move the objective lens from the first position to the second position to approach to the recording medium when an output voltage indicative of a total amount of received light by the light receiving elements for use in obtaining the focus error signal of the light receiving means becomes a predetermined value, and the focus control means performs a focus control based on the second focus error signal when the value indicative of the second focus error signal reaches a range where the focus control can be performed based on the second focus error signal.

5. The optical pickup device as set forth in claim 4, wherein:

while a focus control is being performed based on the second focus error signal, the output voltage indicative of the total amount of received light by the light receiving elements including at least the first light receiving element of said light receiving means becomes larger than a light amount reference value set in a characteristic curve thereof, and an absolute value of the first focus error signal becomes not more than a signal reference value set in a characteristic curve thereof, the focus control based on the second focus error signal is switched to the focus control based on the first focus error signal.

6. The optical pickup device as set forth in claim 1, wherein:

said dividing means is composed of a hologram element.

7. The optical pickup device as set forth in claim 1, wherein:

said dividing means includes a half-wave plate provided either in an optical path of the light passed

through said high numerical aperture region of said condenser lens or an optical path of the light passed through said low numerical aperture region, and a polarized beam splitter.

8. A focus control method, comprising the steps of:

dividing a light emitted from a light source and is reflected from a recording medium into a light passed through a high numerical aperture region of a condenser lens for focusing a light beam and a light passed through a low numerical aperture region of the condenser lens;

detecting the light passed through the high numerical aperture region of the condenser lens and the light passed through the low numerical aperture region of the condenser lens separately; and

performing a focus control based on a first focus error signal obtained from the light passed through at least the high numerical aperture region and the second focus error signal obtained from the light passed through the low numerical aperture region,

wherein the focus control is performed based on either the first focus error signal or the second focus error signal as selected based on at least one of a

characteristic curve of the first focus error signal, a characteristic curve of the second focus error signal, an amount of received light for generating the first focus error signal and an amount of received light for generating the second focus error signal.

9. The focus control method as set forth in claim 8, wherein:

while the focus control is being performed based on the first focus error signal, when an absolute value of the first focus error signal becomes larger than the first reference value set in a characteristic curve thereof, and an absolute value of the second focus error signal becomes not more than the second reference value set in a characteristic curve thereof, the focus control based on the first focus error signal is switched to the focus control based on the second focus error signal.

10. The focus control method as set forth in claim 9, wherein:

said first reference value is set to a value around a limit value of the first focus error signal and is smaller than an absolute value of the limit value; and

said second reference value is set to a value around a limit value of the second focus error signal

and is smaller than an absolute value of the limit value.

11. The focus control method as set forth in claim 8, wherein:

while the focus control is being performed based on the second focus error signal, when an output value indicative of an amount of received light for generating the first focus error signal becomes larger than a predetermined third reference value, and an absolute value of the first focus error signal is not more than a fourth reference value set in a characteristic curve of the first focus error signal, the focus control based on the second focus error signal is switched to a focus control based on the first focus error signal.

12. The focus control method as set forth in claim 8, further comprising the steps of:

i) moving an objective lens, for focusing the light emitted from the light source onto a recording medium, to a first position to be away from the recording medium, when neither of the focus control based on the first focus error signal nor the focus control based on the second focus error signal becomes not available;

ii) after carrying out said step i), performing a

pulling-in operation for moving the objective lens from the first position to the second position to be approximated to the recording medium when an output voltage indicative of an amount of received light for generating the first focus error signal becomes a predetermined value; and

iii) after carrying out said step ii), carrying out a focus control based on the second focus error signal when an output voltage indicative of an amount of received light for generating the second focus error signal becomes larger than a predetermined fifth reference value, and an absolute value of the second focus error signal becomes not more than a sixth reference value set in a characteristic curve of the second focus error signal.